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board, who was returning from Rio Janeiro, and who acted as their pilot and interpreter; by whose means we conversed with the captain. What particularly attracted their attention was, the brother of one of my companions, a fine boy, about seven years old; they took off his cap, they felt his flaxen hair, and loaded him with the most endearing caresses. The first and second mates were broken emigrants from Portugal, and both extremely handsome; the elder, who seemed about twenty-four, after several expressions of kindness, took out a guitar of a large form, and louder tone than any I had before seen or heard, and seating himself on deck, began to play a Brazilian air, and never shall I forget the impression it made on me; the light and fantastic measure, so different from our musical combinations, the tones of the instrument so new, so pleasing to my ear, the emotions of the performer's expressive features, as his fingers swept through every variation of the tune, filled me with sensations that shall remain in my mind a lasting treasure for reflection.

The performer expressed a wish to see my young companions dance, who immediately assenting, began a Scottish reel of four, and kept admirable time to a beautiful fandango tune. The crew collected in a circle around them; delight and satisfaction were pictured in every sun-burnt face. "*Star bon! star bon! benito Irelandese!*" reiterated from every voice. The dance concluded, we got into our boat; the whole crew saluted us with three cheers; we returned it, *con amore*, and as long as memory shall exert her faculty in my mind, I shall think with delight on the Brazilian fandango, and the foreign guitar. L.

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*To the Editor of the Belfast Magazine.*

PERMIT me, sir, to take up a few pages of your valuable Magazine in drawing the attention of some of your readers to a subject not generally understood, especially by those whose business and employment it is.

"A large and elegant bridge, forming a way over a broad and rapid river, is justly esteemed one of the noblest pieces of mechanism that man is capable of performing, and any attempts to advance the theory or practice, highly deserving the encouragement of the public."

As my profession is not that of an architect, very probably I should have been silent, had it not been from hearing and seeing every day, absurd things advanced on the subject.——I will not say a word of that *rickety* bridge near this town, on the Dublin road, which, if I am rightly informed, cost the public upwards of six hundred pounds sterling!!!—nor do I wish to wound the feelings of its architect, but rather to give him a friendly hint lest he fall into similar errors in his present construction.

When a bridge is deemed necessary to be built over a river, the first consideration is the plan of it, or what particular situation will contain a maximum of the advantages over the disadvantages.

The breadth of the river, the navigation upon it, and the velocity and depth of the stream, form considerations of great moment. In most cases, a wider part of the river ought rather to be chosen than a narrow one, especially if it is subject to great tides or floods; for the encreased velocity of the stream in the narrow part being again augmented by the further contraction of the breadth, will both incommode the navigation through the arches, undermine the piers, and endanger the whole bridge. With respect to the form of a bridge, strength, utility, and beauty, ought to be regarded and united, the chief of which lies in the arches.

In fixing on the number of arches, let an odd number always be taken, and few and large ones rather than many and smaller: for thus we shall have not only fewer foundations and piers to make, but fewer arches and centres, which will produce great savings in the expense.

The elliptical arch is in general the best form for most bridges, as it can be made of any height to the same span, or of any span to the same height, while at the same time its haunches are sufficiently strong and elevated above the water, even when it is flat at top—a property which the

other curves are not in the same degree possessed of. The joints of fracture, or the parts most likely to give way, are at the haunches, and the property in this curve is such, that after an arch is built, and the centering struck, it settles more about the haunches than at any of the other parts.

Elliptical arches also look bolder, are really stronger, and require less materials and labour than any others. The cycloidal arch is next in quality to the elliptical, and lastly, the circle.

The elliptic arch of equilibration, is that which is in equilibrium in all its parts, having no tendency to give way in one place more than another, and is therefore recommended as the most durable, commodious, and beautiful of all arches. Every particular figure of the extrados above an arch, requires a particular curve for the under side of the arch itself, to form an arch of equilibration, so that the incumbent pressure on every part may be proportional to the strength or resistance there. When the arch is equally thick throughout (a case that can hardly ever happen) there the catenarian curve is the arch of equilibration, but in no other case whatever; and therefore it is a great mistake to suppose that this curve is the best figure for arches in all cases, when in reality it is the worst.

The catenarian curve, is that form which a chain or rope takes, by hanging freely from two horizontal points of suspension.

As the choice of the arch is of so great moment, let no person either through ignorance or indolence prefer a worse than what is here recommended, because it may seem to him easier to construct; for he would ill deserve the name or employment of an architect, who is not capable of rendering the exact construction of any curve easy and familiar to himself; but if by chance a *bridge-builder* should be employed, who is incapable of doing that, he ought at least to have so much honesty as to procure some person to go through the calculations which he cannot make for himself.

Any of your readers who wish for further information on this subject, are referred to Dr. Hutton's Principles of Bridges, where they will find the matter fully explained. It is to this work I am principally indebted for the present remarks.—But, Mr. Editor, if I can spare time, and that no person better qualified takes up the subject, I will send you easy and correct rules deduced from first principles, adapted chiefly for those who have not studied the subject in a mathematical point of view. M'C.

*Belfast, 22d May*, 1809.

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*For the Belfast Magazine.*

## A DIALOGUE.

AN OLD MAN IS QUIETLY WALKING ALONG, A TRAVELLER COMES AND ACCOSTS HIM.

*TRAV.* Good morning.

*Old M.* Good morning to you kindly.

*Tra.* Can you tell me the way to Wexford?

*Old M.* That I can, for I know the place too well; I am going within a mile of the town, and we can travel together. You seem to be a stranger in the country,

*Tra.* So I am, although I was born here; but I went to sea when I was a boy, and never saw my native country since.

*Old M.* Oh! then, it is woefully changed since that time. The rebellion made sad havock.

*Tra.* The rebellion! I was in England at the time. Did you lose any thing by it?

*Old M.* Yes *(sighing)* I lost every thing, I may say; it happened this time eleven years; I remember it well, for my poor boy joined them; Oh! it was a sorrowful day to me!

*Tra.* Was he compelled to join them?

*Old M.* Yes, his high spirit compelled him. He could not bear to be whipped like a dog, all innocent as he was.

*Tra.* Whipped!—for what reason? I thought none but the guilty were whipped.

*Old M.* No, he was as innocent as a child, and ever loyal to his king; but he was poor and suspected, and that was enough for them. When they came to take my poor, poor boy out, he was teaching his little sister to write, for that was his business when he came home from his work; and my wife